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EXAMINER	
THOMAS, DAVID C	

ART UNIT	PAPER NUMBER
1637	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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	Application No.	Applicant(s)	
Office Action Summary	10/678,946	HONG ET AL.	
	Examiner	**Art Unit**	
	DAVID THOMAS	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 December 2011*.
2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.
3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *67,69-73 and 75-87* is/are pending in the application.
5a) Of the above claim(s) _____ is/are withdrawn from consideration.
6)☐ Claim(s) _____ is/are allowed.
7)☒ Claim(s) *67,69-73 and 75-87* is/are rejected.
8)☐ Claim(s) _____ is/are objected to.
9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.
11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☐ All b)☐ Some * c)☐ None of:
1.☐ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date *11/11/2011*.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant’s amendment filed December 9, 2011 is acknowledged. Claims 67, 70, 73 and 87 (currently amended) and 69, 71, 72 and 75-86 (original previously presented) will be examined on the merits. Claims 1-66, 68 and 74 were previously canceled.

THE FOLLOWING IS A NEW GROUND OF REJECTION NECESSITATED BY APPLICANT’S AMENDMENT

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 67 and 69 are rejected under 35 U.S.C. 102(e) as being anticipated by Parunak et al. (U.S. Patent Pub. No. 2002/0141903).

Parunak teaches a method of obtaining nucleic acid from a sample of heterogeneous biological elements (methods are presented for using a microfluidic system for processing a cell-containing liquid to obtain and amplify nucleic acid after lysis of the cells, for overview, see Abstract and paragraph 11, lines 1-14), the method comprising:

(a) providing a sample comprising heterogeneous biological elements suspended in solution, wherein said elements are cells and/or virions (the sample comprises a particle-containing fluid, such as a liquid containing bacterial or human cells, paragraph 8, lines 1-4);

(b) physically isolating an individual biological element or a subset of the biological elements of the sample within a microfluidic flow channel wherein the isolation step comprises allowing the individual biological element or the subset of the biological elements to flow past a first valve and a second valve of the microfluidic device, and then creating a segment within the flow channel by actuating the first valve and the second valve of the microfluidic device, whereby the element or elements are suspended in solution and are prevented from exiting the segment past the first valve or the second valve (a sample containing particles, such as whole cells or intracellular material from cells, paragraph 32, lines 8-13, is first enriched in the enrichment module, paragraph 63, lines 1-10 and parts 156 and 931, Figures 3 and 4, and then moved from the enrichment module past open valves 915 and 216, see Figure 4, into processing module 158, which may be used for microdroplet preparation, paragraph 69, lines 1-9, paragraph 75, lines 1-7, paragraph 131, lines 1-6 and module 158, Figure 4; valves 915 and 216 are closed to isolate the microdroplet preparation module from the enrichment module and thus effectively prevent the sample from returning to the enrichment module, paragraph 131, lines 1-5; valve 915 is also closed to also allow reuse of the enrichment module, paragraph 53, lines 1-12, while valve 216 is also closed to allow the sample in the microdroplet preparation module to move downstream for further processing, paragraph 89, lines 1-4; the valves may be thermally actuated-type valves, paragraph 53, lines 7-10);

(c) exposing the individual biological element or the subset of biological elements to a lysis chemical, thereby releasing nucleic acids from the biological element(s) (the enriched particle sample is moved downstream to a cell lysis module where material from inside the particles such as intracellular material, including nucleic acids, is released, paragraph 11, lines 7-9, paragraph 69, lines 1-5 and paragraph 81, lines 1-5); and

(d) amplifying at least a portion of the nucleic acid (the nucleic acid may be amplified by the polymerase chain reaction, paragraph 87, lines 1-4),

wherein steps b, c, and d are performed in a microfluidic device (the components for sample receiving, particle enriching, cell lysing and amplification all take place within a microfluidic device, paragraph 46, lines 1-7, paragraph 47, lines 1-11 and Figure 3).

With regard to claim 69, Parunak teaches a method wherein only a portion of the nucleic acid is amplified, wherein said portion comprises a gene sequence associated with the individual biological element or subset of biological elements (the released nucleic acids may be subjected to PCR after mixing with amplification reagents, paragraph 97, lines 1-7 and paragraph 1-7).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 70-73 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parunak et al. (U.S. Patent Pub. No. 2002/0141903) in view of Burlage, R.S. (U.S. Patent Pub. No. 2003/0099928).

With regard to claims 70 and 73, Parunak teaches a method of obtaining nucleic acid from a sample of heterogeneous biological elements (methods are presented for processing a cell-containing liquid to obtain nucleic acid after lysis of the cells, for overview, see Abstract and paragraph 11, lines 1-14), the method comprising:

(a) providing a sample comprising heterogeneous biological elements suspended in solution, wherein said elements are cells and/or virions (the sample comprises a particle-containing fluid, such as a liquid containing bacterial or human cells, paragraph 8, lines 1-4);

(b) physically isolating an individual biological element or a subset of the biological elements of the sample within a microfluidic flow channel wherein the isolation step comprises allowing the individual biological element or the subset of the biological elements to flow past a first valve and a second valve of the microfluidic device, and then creating a segment within the flow channel by actuating the first valve and the second valve of the microfluidic device, whereby the element or elements are suspended in solution and are prevented from exiting the segment past the first valve or the second valve (a sample containing particles, such as whole cells or intracellular material from cells, paragraph 32, lines 8-13, is first enriched in the enrichment module, paragraph 63, lines 1-10 and parts 156 and 931, Figures 3 and 4, and then moved from the enrichment module past open valves 915 and 216, see Figure 4, into processing module 158, which may be used for microdroplet preparation, paragraph 69, lines 1-9, paragraph 75, lines 1-7, paragraph 131, lines 1-6 and module 158, Figure 4; valves 915 and 216 are closed to isolate the microdroplet preparation module from the enrichment module and thus effectively prevent the sample from returning to the enrichment module, paragraph 131, lines 1-5; valve 915 is also closed to also allow reuse of the enrichment module, paragraph 53, lines 1-12, while valve 216 is also closed to allow the sample in the microdroplet preparation module to move downstream for further processing, paragraph 89, lines 1-4; the valves may be thermally actuated-type valves, paragraph 53, lines 7-10);

(c) exposing the individual biological element or the subset of biological elements to a lysis chemical, thereby releasing nucleic acids from the biological element(s) (the enriched particle sample is moved downstream to a cell lysis module where material from inside the particles such as intracellular material, including nucleic acids, is released, paragraph 11, lines 7-9, paragraph 69, lines 1-5 and paragraph 81, lines 1-5); and

(d) amplifying at least a portion of the nucleic acid (the nucleic acid may be amplified by the polymerase chain reaction, paragraph 87, lines 1-4),

wherein steps b, c, and d are performed in a microfluidic device (the components for sample receiving, particle enriching, cell lysing and amplification all take place within a microfluidic device, paragraph 46, lines 1-7, paragraph 47, lines 1-11 and Figure 3).

However, Parunak does not teach a method of characterizing phylogenetic, gene, and functional diversity exhibited by a specific environment comprising a plurality of biological elements or obtaining genetic information regarding an individual biological element of a complex environmental sample by identifying at least one of phylogenetic, gene, and functional diversity of the amplified portion of the purified nucleic acid, or identifying genetic information represented by the amplified nucleic acid, such as by sequence analysis or by transforming a cell with the amplified nucleic acid ligated into an appropriate vector and culturing the transformed cell to clone the amplified sequence.

With regard to claims 70, 72 and 73, Burlage teaches a method of separating particular cells from an environmental sample such as soil or water which have many unculturable microorganisms (see Abstract and paragraph 40, lines 1-6), wherein the method comprises:

a) providing an environmental sample comprising heterogeneous biological elements, wherein the elements are cells (samples include soil samples containing target and non-target microorganisms, paragraph 40, lines 1-6 and paragraph 76, lines 1-3);

b) physically isolating an individual biological element or a subset of biological elements of the sample (a probe is used to isolate a labeled target microorganism from other unlabeled microorganisms, paragraph 17, lines 1-7 and paragraph 35, lines 1-6);

c) exposing the isolated cells to a lysis chemical to liberate the nucleic acids present herein thereby releasing nucleic acid from the biological elements and purification of the nucleic acids (nucleic acid is extracted and purified from the samples, paragraph 69, lines 3-6, paragraph 84, lines 1-29 and paragraph 85, lines 1-4); and

amplification of the purified nucleic acid (the purified nucleic acid is amplified by PCR, paragraph 69, lines 3-6, paragraph 85, lines 1-6 and paragraph 86, lines 1-8).

With regard to claim 71, Burlage teaches that genetic diversity of a Pseudomonas is elucidated by sequence analysis (paragraph 88, lines 1-10).

With regard to claim 75, Burlage teaches that the isolated nucleic acid is cloned and cultured into a culturable microorganism to synthesize the gene product (paragraph 72, lines 1-5).

It would have been prima facie obvious to one having ordinary skill in the art at the time the invention was made to combine the methods of Parunak for using a microfluidic system for processing a cell-containing liquid to obtain and amplify nucleic acids after lysis of the cells and with the methods of Burlage for analysis of particular cells such as those of unculturable microorganisms from an environmental sample since the samples taught by Burlage can easily be processed using the microfluidic system of Parunak. Thus, an ordinary practitioner would have been motivated to use the microfluidic system taught by Parunak for processing samples containing unculturable microorganisms such as those taught by Burlage, since these microorganisms cannot be grown in pure cultures by known means, but "represent a vast, untapped resource of DNA and of potential products such as enzymes and other protein products…that would be useful for environmental, medical or industrial applications. However, these potential products are currently unavailable because there is no way to obtain pure DNA from such microorganisms" (Burlage, paragraph 3, lines 1-12). While Burlage employs techniques such as FACS for cell sorting, followed by manual operations for DNA extraction and amplification, given the advantage of combining these assays on a single microfluidic device as described by Parunak, one of ordinary skill in the art at the time the invention was made would have been motivated to employ a microfluidic device which is well known and recognized in its ability to incorporate many biological assays into a single chip, so as to benefit from its ability to employ less sample/reagents, reduce chances of contamination and reduce the time required for the assay.

7. Claims 76, 79, 80, 83, 84 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parunak et al. (U.S. Patent Pub. No. 2002/0141903) in view of Nelson et al. (U.S. Patent No. 6,007,690).

Parunak teaches the limitations of claims 67 and 69, as discussed above. However, Parunak does not teach a method wherein the lysis chemical is introduced through a cross-flow injector structure, wherein the cross-flow injector structure comprises the intersection of a first microfluidic flow channel and a second microfluidic flow channel. Parunak also does not teach a method wherein cell or virion lysis occurs in a rotary mixer of the microfluidic device.

With regard to claims 76, 80 and 84, Nelson teaches a method wherein the lysis chemical is introduced through a cross-flow injector structure, wherein the cross-flow injector structure comprises the intersection of a first microfluidic flow channel and a second microfluidic flow channel (lysis buffer and other reagents may be injected into the device by specially designed injection ports, column 22, lines 36-45 and Figure 23; injection of reagents may also be made at an injection cross where main and secondary flowpaths intersect, column 16, lines 60-67 and Figure 5 and 12).

With regard to claim 79, 80 and 84, Nelson teaches a method wherein cell or virion lysis occurs in a rotary mixer of the microfluidic device (to enhance cell lysis, mixing can be achieved by arranging the supply channels so that the streams sample and reagents merge, and may be enhanced by an applied electric field or by periodically reversing the polarity of the electrodes at the inlet and outlet ports to move the mixture in an oscillatory manner, wherein aperture-like structures can also be molded into the chamber housing (column 22, line 67 to column 23, line 10).

It would have been prima facie obvious to one having ordinary skill in the art at the time the invention was made to combine the methods of Parunak for using a microfluidic system for processing a cell-containing liquid to obtain and amplify nucleic acids after lysis of the cells and with the methods of Nelson, who also teaches an integrated microfluidic system for processing cell samples for a variety of applications such as genomic screening and diagnostics. Thus, an ordinary practitioner would have been motivated to combine the microfluidic system taught by Parunak with features of the microfluidic system taught by Nelson, such as a means for reagent injection and also mixing of the reagents in the reaction chamber. Injection of samples and reagents through different injection ports may be necessary to accommodate differences in the sample and reagents, particularly if reagents come in different forms or are supplied in different kits (Nelson, column 22, lines 36-53). The use of an injection cross can provide for injection from the intersection of a geometrically defined plug of sample components from the fraction of interest (Nelson, column 16, lines 65-67). Lysis may occur within minutes after addition of sample to the chamber containing lysis solution, but may be enhanced by various mixing strategies (Nelson, column 22, line 62 to column 23, line 10).

8. Claims 77, 78, 81, 82, 85 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parunak et al. (U.S. Patent Pub. No. 2002/0141903) in view of Unger et al. (U.S. Patent No. 6,408,878).

Parunak teaches the limitations of claims 67 and 69, as discussed above. However, Parunak does not teach a method wherein the individual biological element or the subset of biological elements is isolated within the microfluidic channel through the activation of a deflectable membrane, or wherein the deflectable membrane is activated by a control line.

With regard to claims 77, 81 and 85, Unger teaches a method wherein the individual biological element or the subset of biological elements is isolated within the microfluidic channel through the activation of a deflectable membrane (the flow of fluid through a microchannel, such as in a DNA chip, column 39, lines 19-29, may be controlled using deflectable membranes to direct fluid through a port or through a microchannel depending on whether the membrane is acuated or not, column 40, lines 6-23).

With regard to claim 78, 82 and 86, Unger teaches a method wherein the deflectable membrane is activated by a control line (the deflectable membranes may be controlled to actuate at a speed of 100 Hz or greater and may be controlled so as to peristaltically pump a flow of fluid through a microchannel, column 40, lines 23-34 and line 62 to column 41, line 5).

It would have been prima facie obvious to one having ordinary skill in the art at the time the invention was made to combine the methods of Parunak for using a microfluidic system for processing a cell-containing liquid to obtain and amplify nucleic acids after lysis of the cells and with the methods of Unger, who also teaches a microfluidic pumping system for a variety of applications such as use in a DNA chip (see column 39, lines 19-29) and teaches methods for moving samples through microchannels of the device by a peristaltic process facilitated by actuation of a series of deflectable membranes (column 40, line 62 to column 41, line 5). Thus, an ordinary practitioner would have been motivated to combine the microfluidic system taught by Parunak with features of the microfluidic pumping system taught by Unger, since the methods of Unger provide an efficient means of moving fluids throughout the microchannel system with the use of deflectable membranes that is compatible with the actuation system of Parunak whereby fluids may be moved by gas pressure but are may also be supplemented by other pressure generation techniques that include mechanical actuators (Parunak, paragraph 66, lines 1-8). Parunak further teaches the use of a computer for control of all operations of the microfluidic device (Parunak, paragraphs 34 and 37).

Response to Arguments

9. Applicant's arguments filed December 9, 2011 have been fully considered but they are not persuasive.

Applicant argues that the objection to claim 70 should be withdrawn since the claim is amended to correct a typographical error. The Examiner agrees and the objection is withdrawn.

Applicant then argues that the rejection of claim 87 under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention should be withdrawn since the claim is amended to correct a typographical error, thus overcoming the rejection. The Examiner agrees and the rejection is withdrawn.

Applicant then argues that the rejection of claims 67 and 69 under 35 U.S.C. § 102(e) as being anticipated by Parunak et al. (U.S. Patent Pub. No. 2002/0141903) should be withdrawn since the reference fails to disclose all the limitations of the claims as amended. In particular, Applicant argues that Parunak, while disclosing methods and a system for processing microfluidic samples of particle-containing fluids in which some particles are concentrated by allowing fluid containing smaller particles to exit an enrichment zone, does not disclose or suggest a method wherein biological elements are separated from other biological elements. Applicant further argues that Parunak does not disclose a method wherein a sample is isolated within a microfluidic device by allowing the sample to flow past a first and second valve, which are then closed to isolate the sample within a segment of device by preventing the sample from exiting past the closed valves.

The Examiner agrees that the passages of Parunak as applied to the claims prior to amendment do not teach the limitations as now claimed, particularly with regard to allowing the sample to flow past two valves and then closing the valves to prevent the sample from passing back through the valves. However, the claims are now rejected under new grounds by applying different teachings of the same reference of Parunak, and therefore the arguments with regard to Parunak as previously cited by the Examiner are moot. Thus, with regard to the claims as amended, Parunak teaches that samples within the microfluidic device pass through two open valves when moving from the enrichment module to the processing module (see Figures 3 and 4, parts 156, 158, 216 and 915), and therefore the sample is segmented since a portion of the sample will remain in the enrichment module for further concentration, while the portion that has moved into the processing module, and now separated from the other portion after closing of the two valves, may now be processed to make microdroplets prior to moving the sample further downstream into the lysis module (part 160).

Applicant then argues that none of the secondary references make up for the deficiencies of Parunak and that a case of *prima facie* obviousness has not been established for any of the remaining claims. As discussed above, claims 67 and 69 are now rejected under 35 U.S.C. § 102(e) as being anticipated by Parunak under new grounds in response to the claims as amended, and therefore any arguments with regard to the deficiencies of Parunak in relation to the secondary references is moot.

Applicant further argues that, with regard to claims 70-73 and 75, there is no motivation to combine the teachings of Burlage, R.S. (U.S. Patent Pub. No.

2003/0099928) with Parunak since the FACS-based separations taught by Burlage would not be enabled using the device of Parunak. The Examiner asserts that the combination of the teachings of Parunak and Burlage was not intended to combine the actual methods of Burlage but rather the teaching pertaining to the practice of Burlage for processing unculturable microorganisms from an environmental sample, since such samples can be readily processed using the methods and devices of Parunak.

Applicant further argues that, with regard to claims 76, 79, 80, 83, 84 and 87, Nelson et al. (U.S. Patent No. 6,007,690) is not combinable with Parunak since Nelson does not teach introduction of a lysis solution through a cross-flow injector structure, and furthermore does not describe lysis using a rotary mixer. The Examiner asserts that Nelson teaches a method wherein lysis buffer and other reagents may be injected into a microfluidic device at an injection cross where main and secondary flowpaths intersect (Nelson, column 16, lines 60-67 and Figures 5 and 12), which could easily be introduced into the device of Parunak to form a cross-flow injector structure within the lysis module (Parunak, part 160, Figure 4). In addition, the Examiner asserts that Nelson teaches a means for mixing samples, such as a sample undergoing lysis, by movement in an oscillatory manner using an applied electric field, which allows the sample to be mixed in a rotary- or oscillatory-like fashion with the aid of aperture-like structures to move the sample repeatedly and rapidly back and forth to apply increased mechanical shear to the cells (Nelson, column 22, line 67 to column 23, line 10). This type of mixing is compatible with the means for mixing as taught by Parunak using agitation forces to enhance mixing within a mixing zone (Parunak, paragraph 99, lines 1-10).

No further arguments are made with regard to Unger et al. (U.S. Patent No. 6,408,878) for claims 77, 78, 81, 82, 85 and 86. Therefore, based on all of the discussion above, claims 67 and 69 are now rejected under 35 U.S.C. § 102(e) over Parunak under new grounds. The rejections of the remaining claims under 35 U.S.C. § 102(e) over Parunak in view of Burlage, Nelson or Unger are maintained, as described above, based at least in part on the rejection of the base claims under new grounds with regard to the teachings of Parunak.

Summary

10. Claims 67, 69-73 and 75-87 are rejected. No claims are allowable.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David C. Thomas whose telephone number is 571-272-3320 and whose fax number is 571-273-3320. The examiner can normally be reached on 5 days, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/David C Thomas/
Examiner, Art Unit 1637

/Kenneth R Horlick/

Primary Examiner, Art Unit 1637